U.S. Environmental Protection Agency Region 10 and
Washington State Department of Ecology
Official Consultation Meeting
February 27, 2003, 1:00 pm - 3:00 pm
Ecology Office Building - Olympia, WA

AGENDA

Upper Columbia River

Introductions — All

Update — EPA

- status of Upper Columbia River draft site investigation report
- planned schedule for Region 10 internal Management Review Team Meeting

Overview of Region 10 Management Review Team process — EPA

Views and opinion on possible site management options — Ecology

- Formal State Deferral
- NPL listing
- Other Superfund action (enforcement under Superfund Alternative Site guidance, other enforcement)
- Other (e.g. Teck Cominco American Inc. proposal for independent consensus-driven third party process)

Ecology's recommended option(s) and position on any potential NPL listing

Open discussion/Q & A

Closing

Adjourn

Meeting participants

EPA

John Iani, Regional Administrator
Mike Gearheard, Director, Office of Environmental Cleanup
Tom Eaton, Director, Washington Operations Office
David Croxton, Unit Manager, Brownfields & Site Cleanup
Sandra Johnson, Director, Tribal Office
or Alan Moomaw, Tribal Office

Ecology

Tom Fitzsimmons, Director
Jim Pendowski, Program Manager, Toxics Cleanup
Tom Laurie, Tribal Liaison
Flora Goldstein, Section Manager, Toxics Cleanup Program-Eastern Regional Office

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Background

The findings of EPA's 2001 sampling investigation confirm the findings of previous studies documenting the presence of hazardous substance contamination at the Upper Columbia River. The data suggests that further detailed investigation of contamination at the Upper Columbia River is warranted.

The EPA Region 10 Management Review Team will convene in April of 2003 to evaluate the site with the goal of reaching a consensus recommendation on next steps.

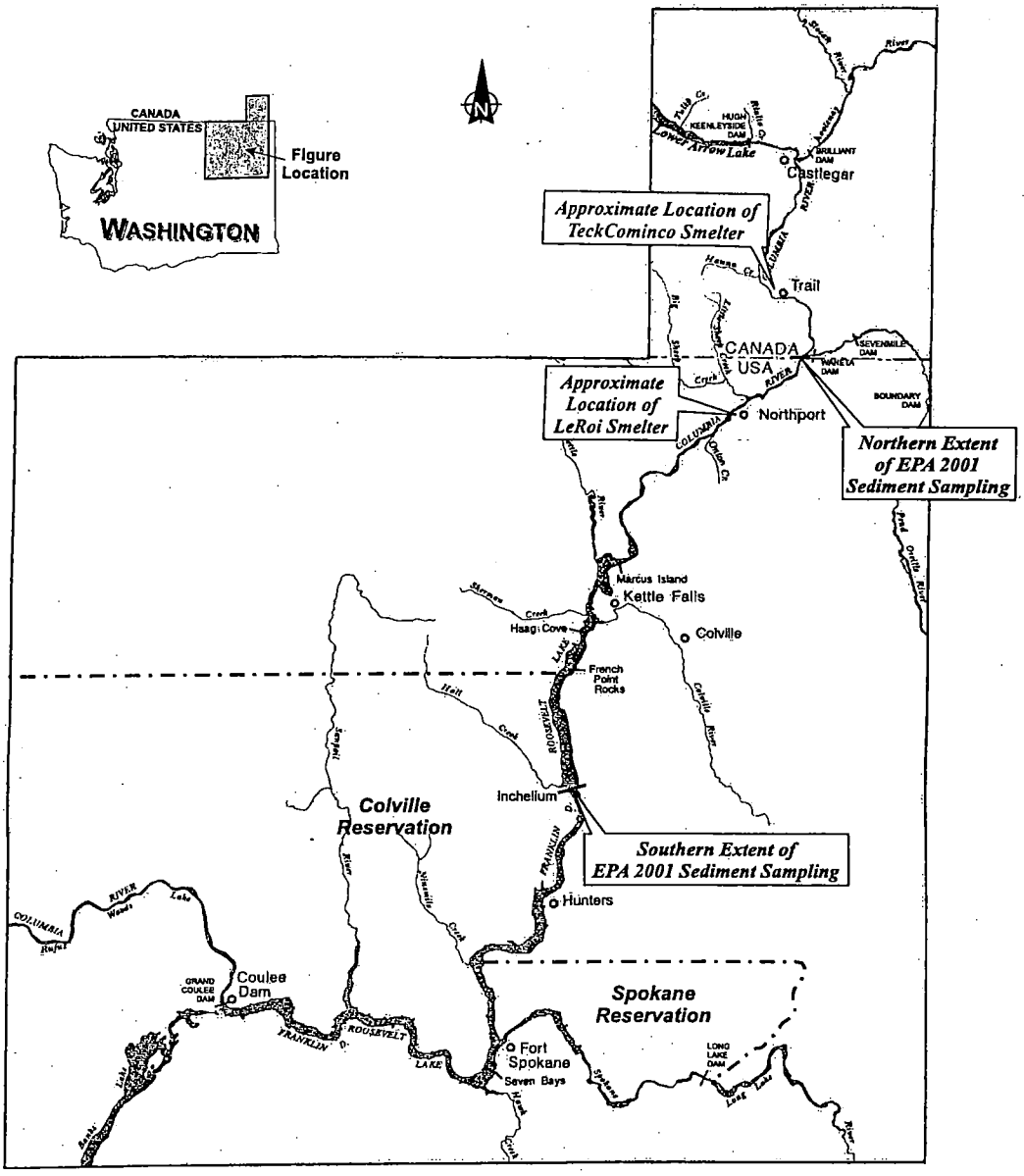
Information to be considered by the Region 10 Management Review Team in its evaluation of the site includes technical findings, input received from the state, tribe, community, interested parties, and other facts.

Purpose of EPA-Ecology official consultation meeting

The purpose of the EPA-Ecology consultation meeting is to hear Ecology's views about the site and to solicit its opinion on possible site management options.

The input provided by Ecology representatives will be shared with the Management Review Team members during its meeting planned for April 2003.

Upper Columbia River Expanded Site Investigation



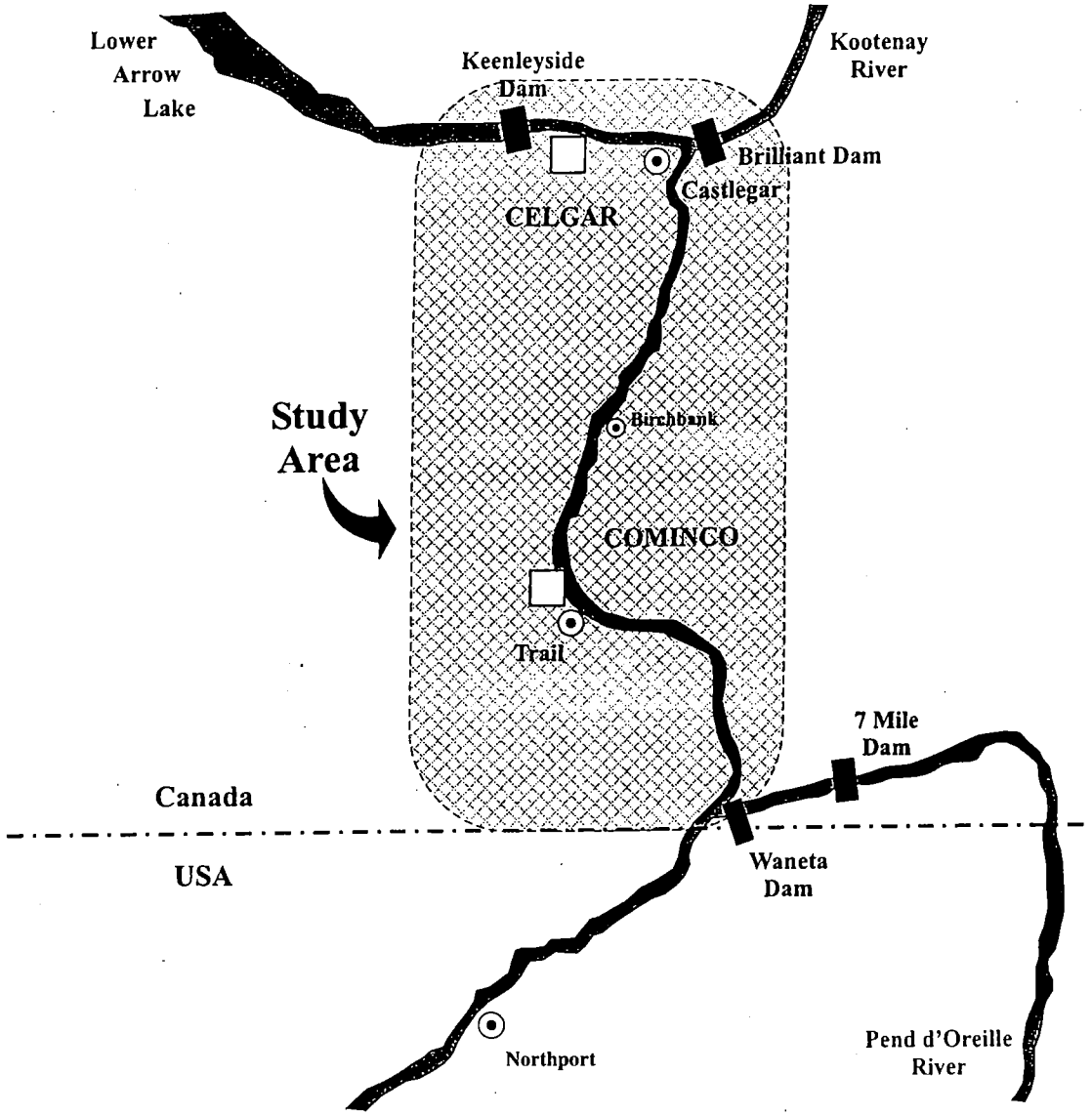
EPA 2001 Field Activities

- 58 sediment samples collected from river main stem between US-CAN border and Inchelium
- 110 tributaries sampled between Inchelium and border
- 61 mines & mills visited to identify potential sources of contamination

General findings

- results support previous studies that documented contamination of river sediments
- examples of metals found at elevated levels with respect to background are arsenic, cadmium, copper, lead, mercury and zinc
- several sediment samples consisted primarily of slag, a by-product of smelting furnaces

Teck Cominco Trail Ecological Risk Assessment



The Study Area *encompasses roughly 40,000 hectares of public and private property extending from Castlegar, BC to the US-CAN border. The Cominco Trail Ecological Risk Assessment was initiated in 2000 and is ongoing.*

Examples of aquatic/terrestrial chemicals of concern *are aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc.*

Examples of ecological receptor species of concern *are walleye, mountain whitefish, rainbow trout, peamouth chub, prickly sculpin, white sturgeon, aquatic plants, attached algae, invertebrates, peregrine falcon, and amphibians.*

Upper Columbia River
Technical Findings

REGION 10

Outline

Results

- Trends
- Human Health
- Ecological Health

Next Steps

Introduction

- Study area: U.S. Canadian Border to Inchelium
- Collect data to determine potential for NPL listing
- Interpret results
  - Identify patterns
  - Compare with available human and ecological benchmarks

Don't know

Representative of human exposures

Sample locations	- where
Site uses	- what activities
Sample types	- which media and analytes
	- fish tissue residues
	PCBs & Dioxins

Assumptions determine who and what is assessed and protected

Fate and transport processes (also for Eco)

Human Health Benchmarks

Use Assumptions Determine Risk-Based Screening Levels

Risk increases with exposure & use:

Rank order:

1) Tribal subsistence
2) Residential
3) Recreational

Three Types of Health Risk:

- Arsenic - Increased probability of cancer
  = Exposure x Cancer Potency Factor

- Lead - Predictive Blood Lead Model (EPA-IEUBK)
  Goal: < 5% probability of PbB > 10 µg/dl

- Other - Compare exposure to threshold
  Hazard Quotient = Exposure / Reference dose

Human Health Summary

~10% exceedances of recreational benchmarks for lead (5/49) and arsenic (4/49)

- Highest levels were 2x recreational values (Coeur d'Alene & Spokane Rivers)
- Other metals were mostly below residential benchmarks
  - few above 2x residential benchmark

Eco Risk – Methods: Lines of Evidence

- Sediment Chemistry
  - *Compare to benchmarks*
- Sediment Toxicity
  - *Available toxicity test results*
- Effects on Biotic Communities
  - *Benthic organisms*
  - *Fish*
- Bioaccumulation into Tissues

Eco Risk – Summary: Lines of Evidence

- Sediment Chemistry: *repeated, consistent exceedance of benchmarks*
- Sediment Toxicity: *repeatedly noted at sites near border*
- Effects on Biotic Communities
  - *Benthic organisms – effects seen*
  - *Fish* – needs study
- Bioaccumulation: *4 – 60x metals*

Eco Freshwater Sediment Chemistry Benchmarks

- Background/upstream
- Cominco Trail Aquatic ERA
- Other Benchmarks
  - CDA - RI
  - WA State

Background/Upstream

	CANTOX Upstr-Ave	CANTOX Upstr-Max	WDOE Arrow Lake	EPA-SI Background	USGS Background
As	1.07	1.24	2	2	6.5
Cd	0.157	0.198	0.46	0.47	0.2
Cr	12.7	29.2		12	84
Cu	11.6	15.9	3.6	3.5	20
Pb	8.39	8.83	11.5	11	24
Hg	0.035	0.05	0.0004	0.0004	0.028
Ni	7.18	9.23		13.4	34
Se	0.75	1		5	0.2
Ag	0.0952	0.144		0.5	0.5
Tl	0.0448	0.05		5	
V	21	50.6		5.93	84
Zn	49.2	83.4	26.9	26.9	74

CANTOX 1995-1999: WDOE 2001: SI

Sed Chem

Cominco ERA Problem Formulation

	Low	High	Screening Concentration (mg/kg dw)
As	5.7	17	5.7
Cd	0.6	3.5	0.6
Cr	36.4	90	36.4
Cu	35.1	200	35.1
Pb	33.4	91.3	33.4
Hg	0.16	0.49	0.16
Ni	16	75	16
Se	5	5	5
Ag	0.5	2.2	0.5
Zn	120	320	120

CANTOX Sediment Quality RANGE (2002 draft - Vol II - Table 6-14; p 6-60)

Sed Chem

From CDA (Table E-6)

Analytes Evaluated	Preliminary Remedial Goal (mg/kg dw)		
	CSM Units 1 and 2	CSM Units 3 and 4	CSM Unit 5
Arsenic	22	13	9.3
Cadmium	2.7	0.68	0.7
Copper	53	28[a]	28[a]
Lead	171	47	35[a]
Mercury	0.3	0.17[a]	0.17[a]
Silver	1.1	0.73[a]	0.73[a]
Zinc	280	98[a]	98[a]

[a] PRGs based on toxicity reference values; other PRGs default to background concentrations for those portions of the Basin

Eco 1: Freshwater Sediment Chemistry

Three patterns & hypothetical explanations
(consistent with numerous studies from mid 1980's to present)

- High at border, decreasing to S *(e.g., Zn, Cu, As)*
  - Consistent with slag as a source
  - Canadian studies:
    - 40x increase in metals downstream from Trail
    - Beaver Creek station characterized as primarily slag
  - USGS (1992): Cu & Zn 20x benchmarks
  - USGS (2002): Cu & Pb in 64 um fraction – low conc.; same pattern
  - Ecology (2001): Cu & Zn 550x & 600x Arrow Lake

- Peaks in the middle *(e.g., Hg)*
  - Consistent with mining as a source; USGS – Hg, Cd, Pb

- No pattern *(e.g., V)*
  - Consistent with background as a source or multiple sources

Eco 2: Freshwater Sediment Toxicity

- Canadian Studies
  - CRIEMP (1994) - Single tests showed 33% and 27% amphipod survival immediately downstream of both Celgar and Cominco
  - Env Can (1992) – slag 0% survival with high Cu & Zn in overlying water; downstream - 0% survival
  - DFO (1992) – slag toxicity to 5 different organisms
- USGS (1992)
  - Northport reach – adverse effects to 3 different organisms
- WA State – Ecology (2001)
  - Highest toxicity (0-50% survival) = highest metals

Eco 3a: Benthic Invertebrate Communities

- Canadian Studies - CRIEMP (1994)
  - Community differences downstream associated with Cu, Pb, Sb, Sr, Zn
- USGS (1992)
  - Riffles – disturbed community (3-14 taxa v. 30+)
  - Depositional areas – difficult to asses; naturally low
- Cominco Trail Aquatic ERA (2003)
  - Species richness and density slightly lower: "a predictable, graded response to heavy metal concentrations."
  - Data from 1999 & 2001

Eco 3b: Fish

- Cominco Trail Aquatic Problem Formulation (2003)
  - Fish Tissue: Potential for Cd & Cu to affect fish (4x & 9x tissue benchmarks)
  - Fish Health: poor datasets (small sample size, high variability, different programs, etc.)

Eco 4: Bioaccumulation

- Canadian Studies
  - CRIEMP (1994) – significant changes to effluent discharges have occurred since this study
    - Indication of 4 to 60x greater tissue concentrations of metals (Zn, Cu, Pb, Sb) in caddis fly and mussels at Waneta
- US Studies
  - USGS (1992) – reviews a long history of fish contamination
    - Walleye – Hg – Canadian consumption advisory
    - Large-scale Sucker – Pb, Zn, Cu
    - Lake & mountain whitefish – dioxin/furan – Canadian consumption advisory
- Cominco Trail Aquatic Problem Formulation (2003)
  - Fish tissue accumulation of metals above benchmarks (5 species)
  - Nov 2001 study of 4 species downstream

Next Eco-Risk Steps by Cominco

Draft Aquatic Problem Formulation Report 2002

Section 5.4 – Summary

"Further site-specific data to reduce uncertainty and add strength to the weight of evidence is needed."

Next Eco-Risk Steps by Cominco

Draft Aquatic Problem Formulation Section 5.3 – Data Gaps

- Sediment Chemistry
  - *Measure in depositional zones*
  - *Estimate Bioavailability using sequential extraction*
- Sediment Toxicity:
  - *Toxicity tests with metal mixtures*
- Effects on Biotic Communities
  - *Benthic organisms –*
    - *Periphyton, benthos: near v. far field*
  - *Fish*

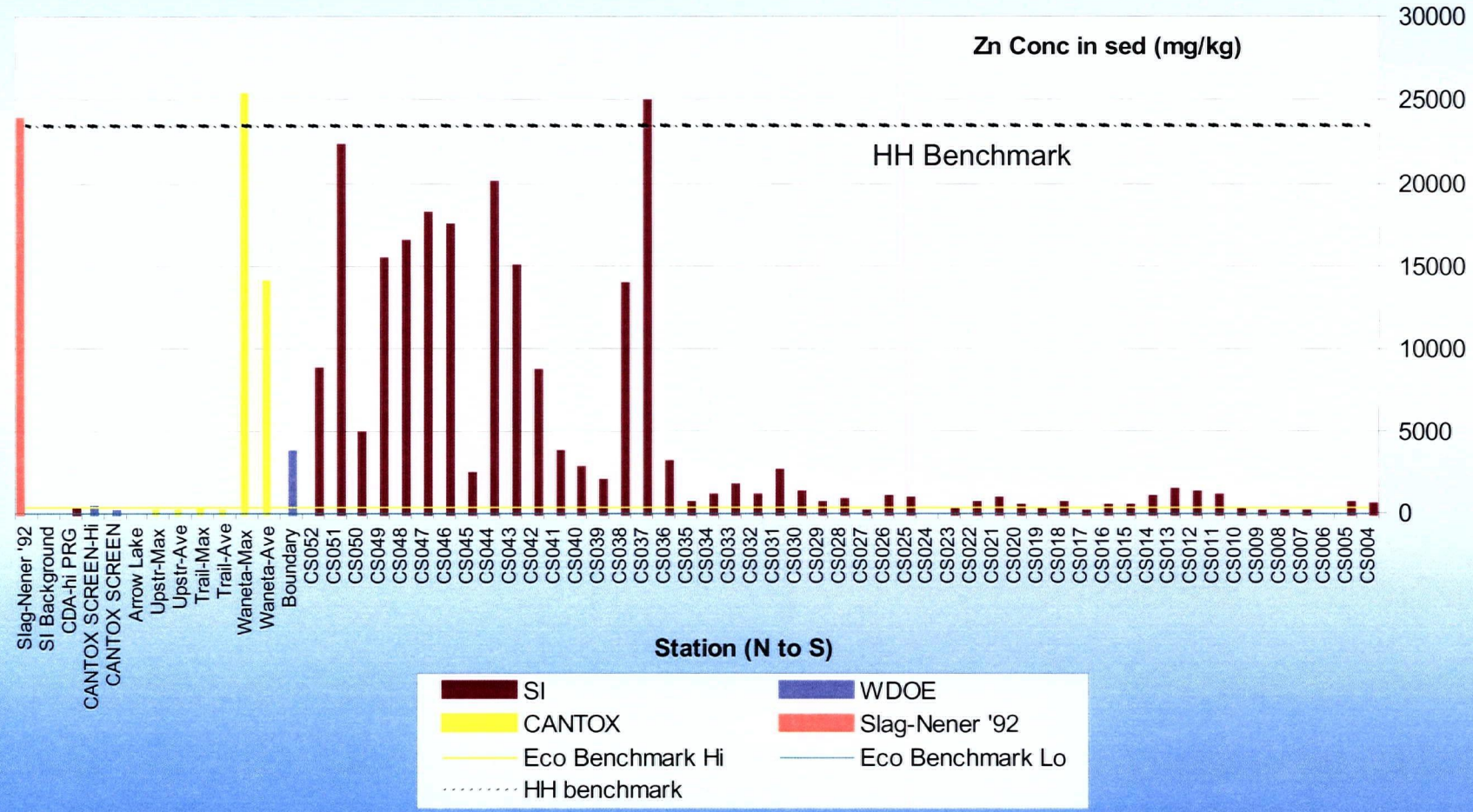
    Habitat/use
    - *relative fish abundance*
    - *white sturgeon rearing and over wintering habitats*
    - *forage fish habitat*
    - *Riparian vegetation*
    - *Water velocity*

    Health
    - *Upstream v. downstream*
- Bioaccumulation:
  - *Food chain transfer to periphyton, benthic invertebrates, fish*

Zinc

Highest eco comparison value = 320 mg/kg (upstream peaks)

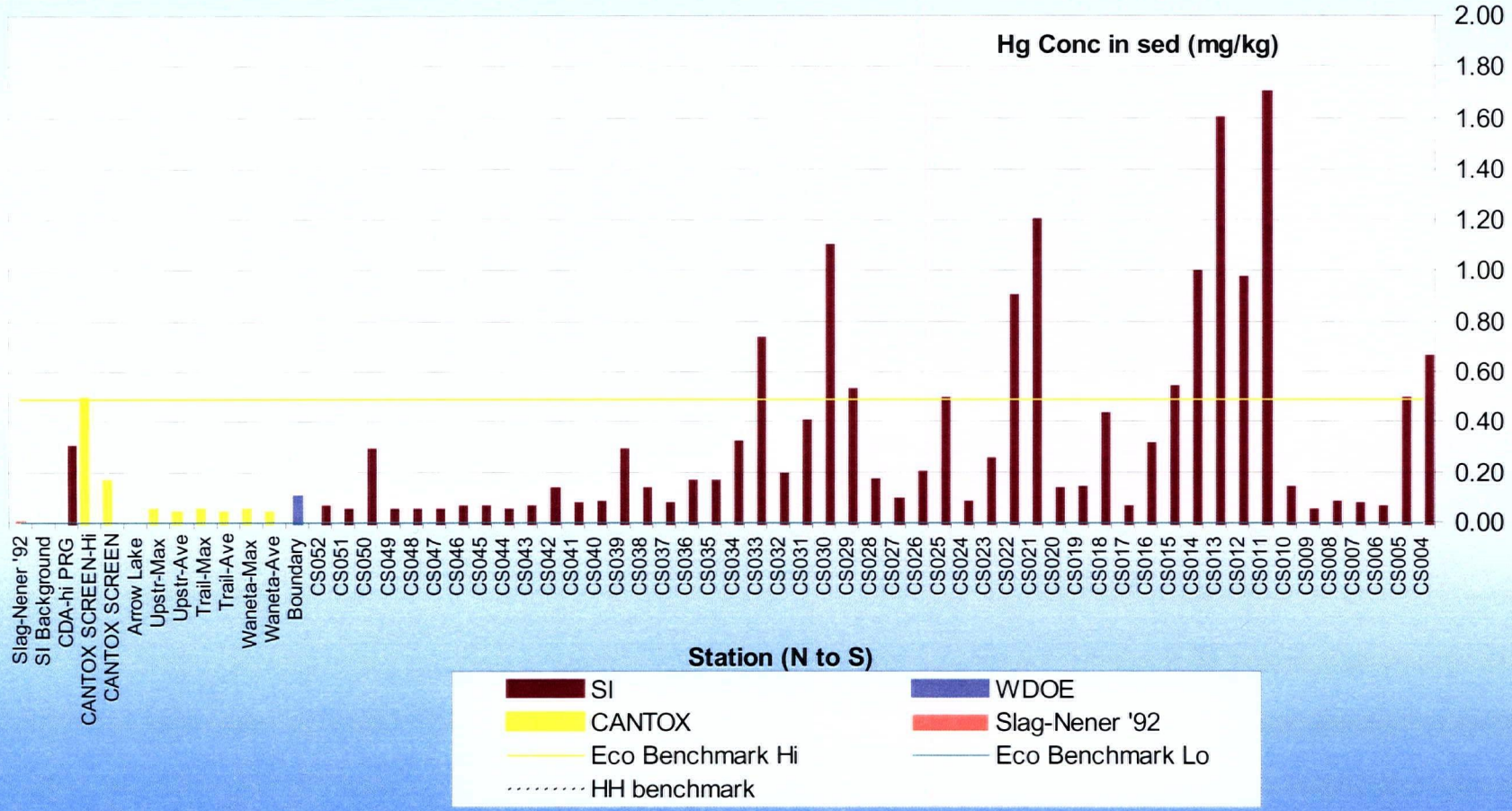
Zinc in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons



Mercury

Highest eco comparison value = 0.49 mg/kg (downstream peaks)

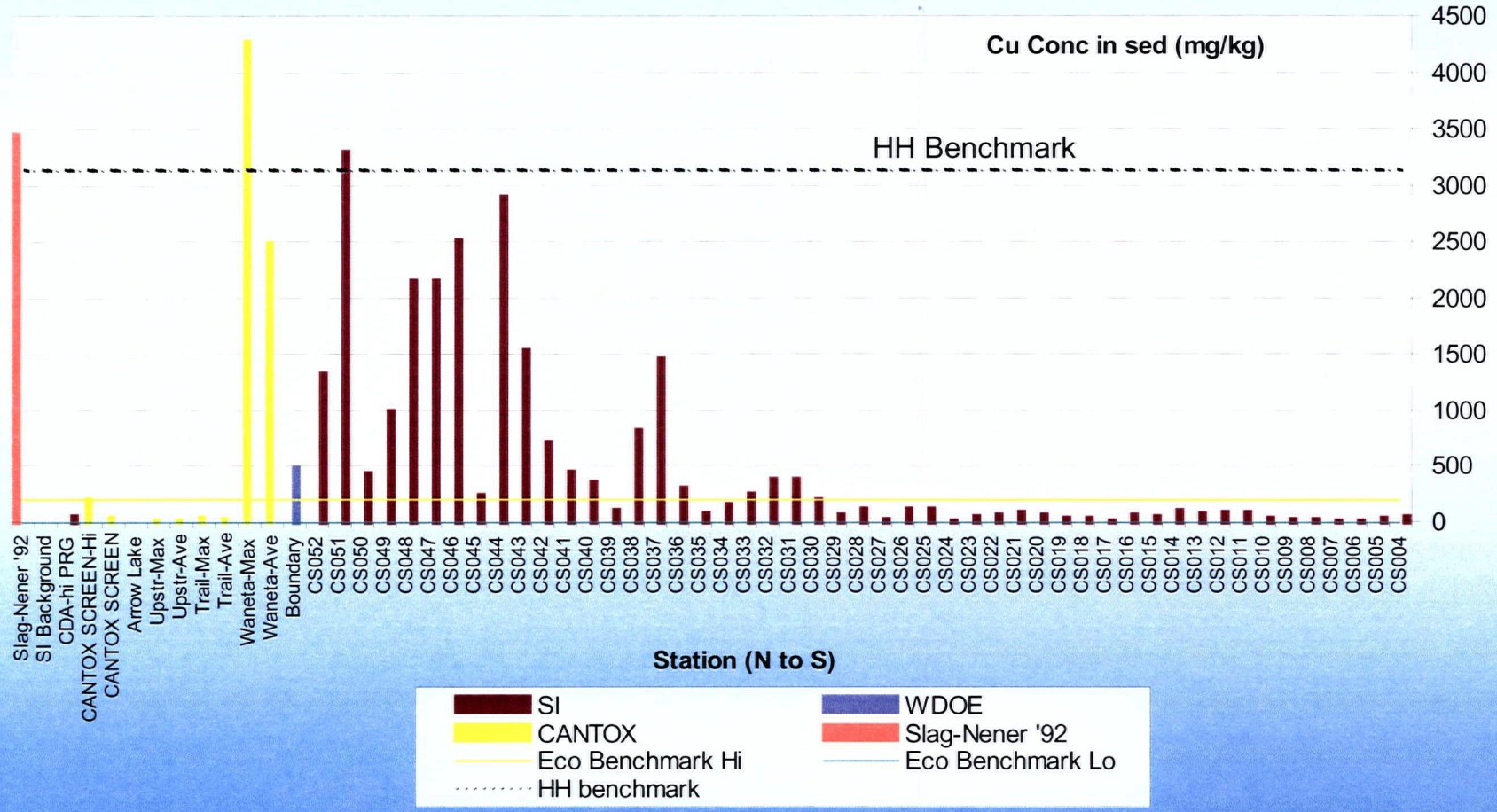
Mercury in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons
Slag below detection (<0.005 mg/kg dw)



Copper

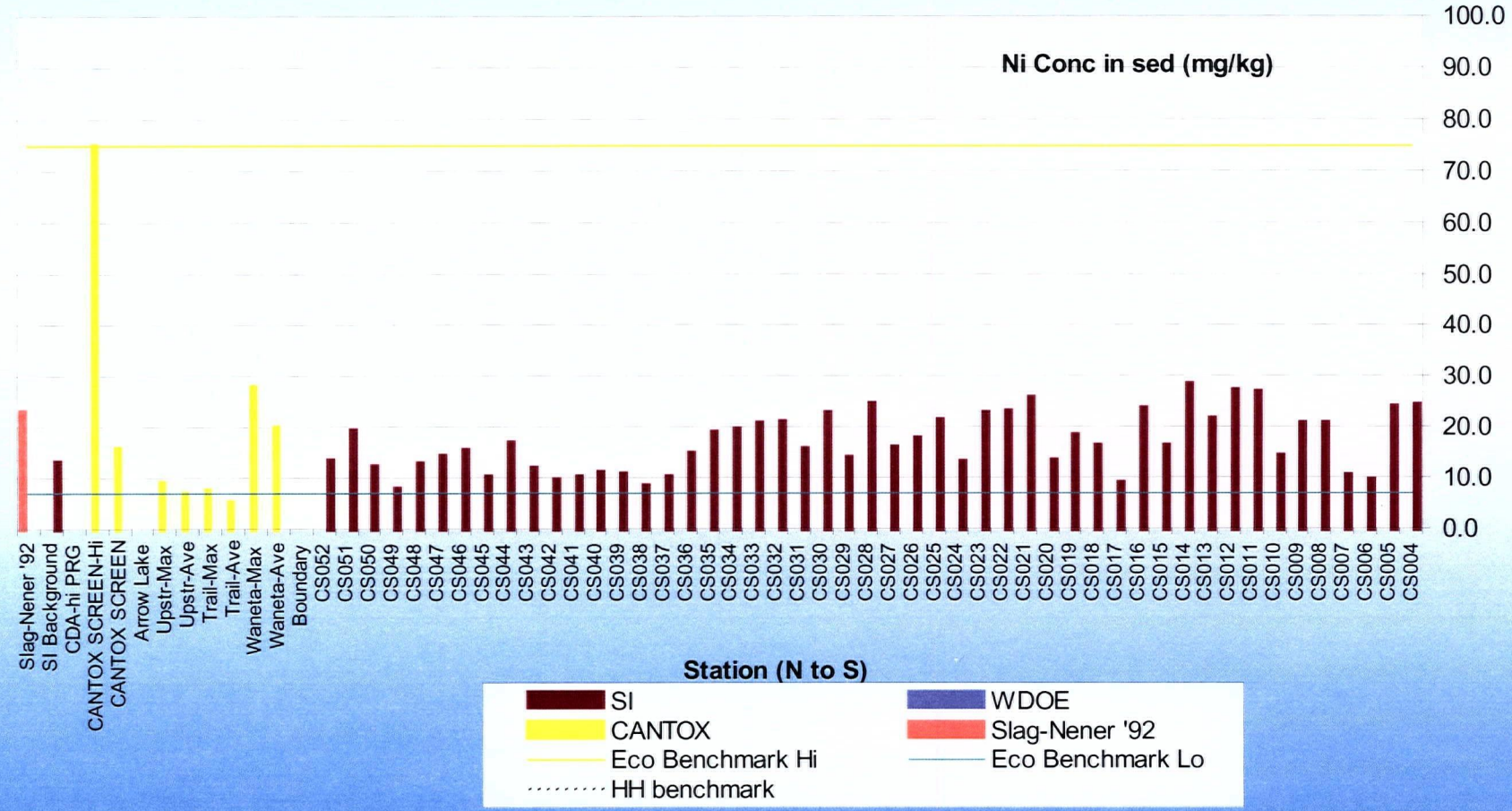
Highest eco comparison value = 200 mg/kg (upstream peaks)

Copper in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons



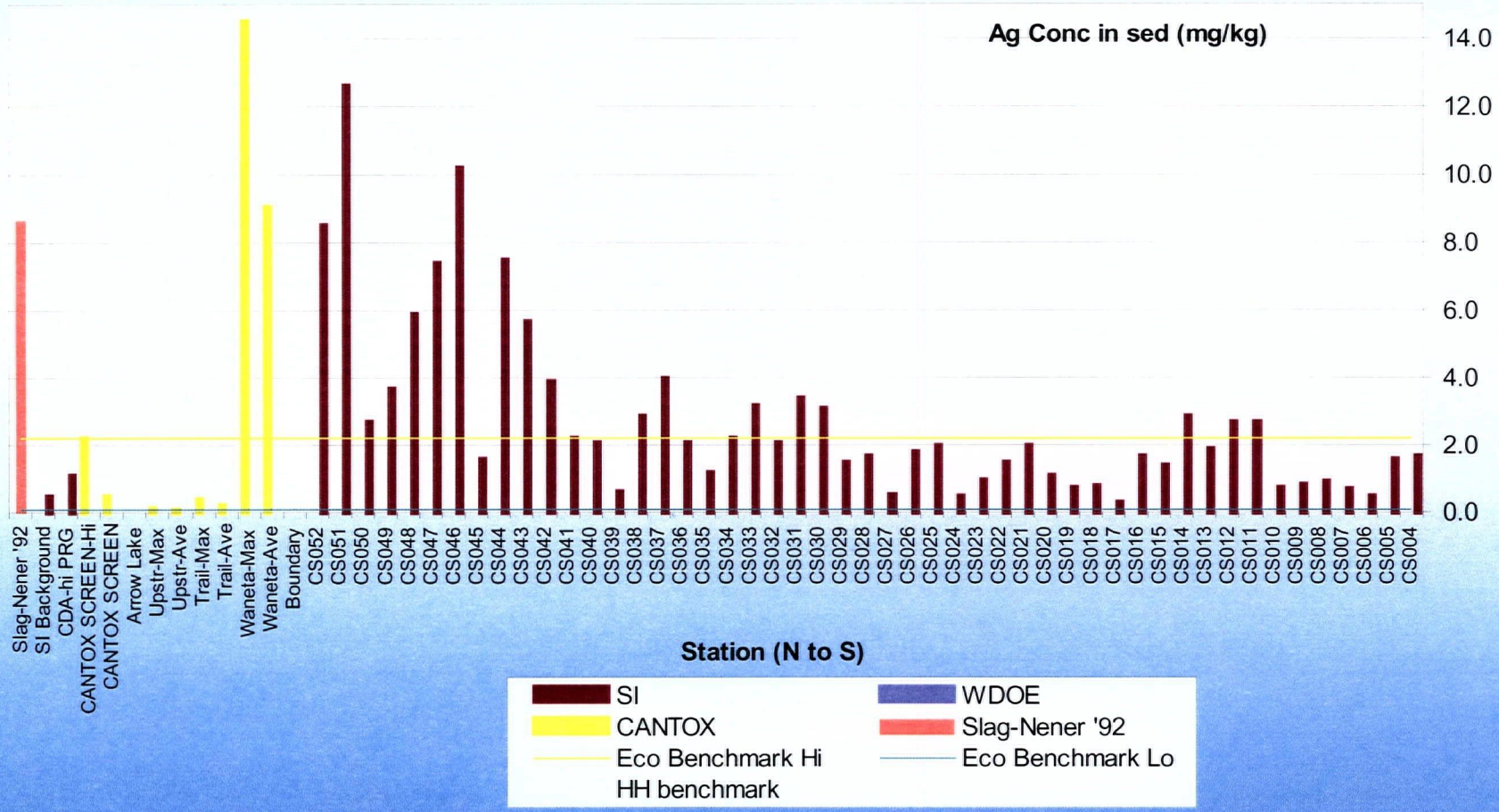
Nickel

Nickel in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons



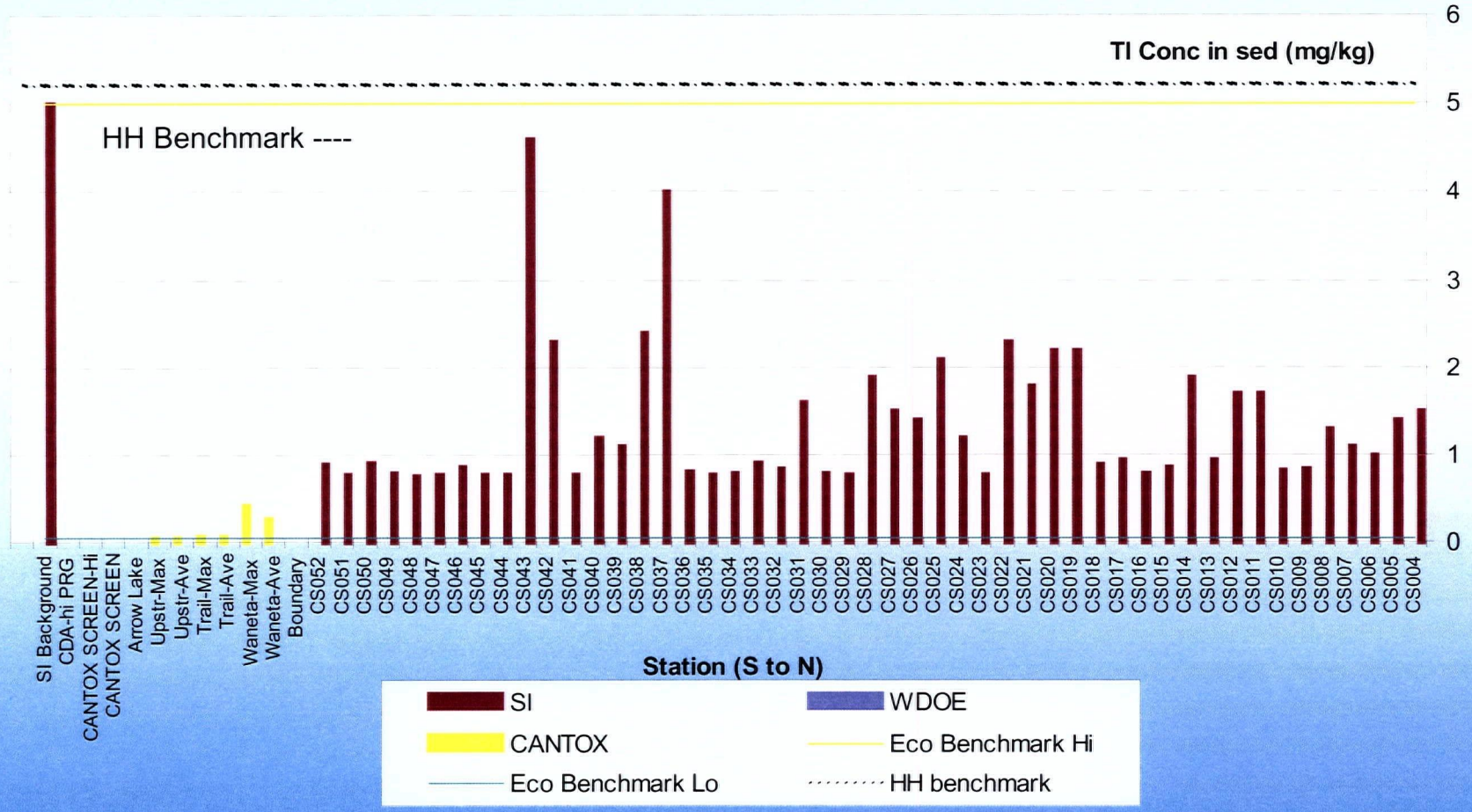
Silver

Silver in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons



Thallium

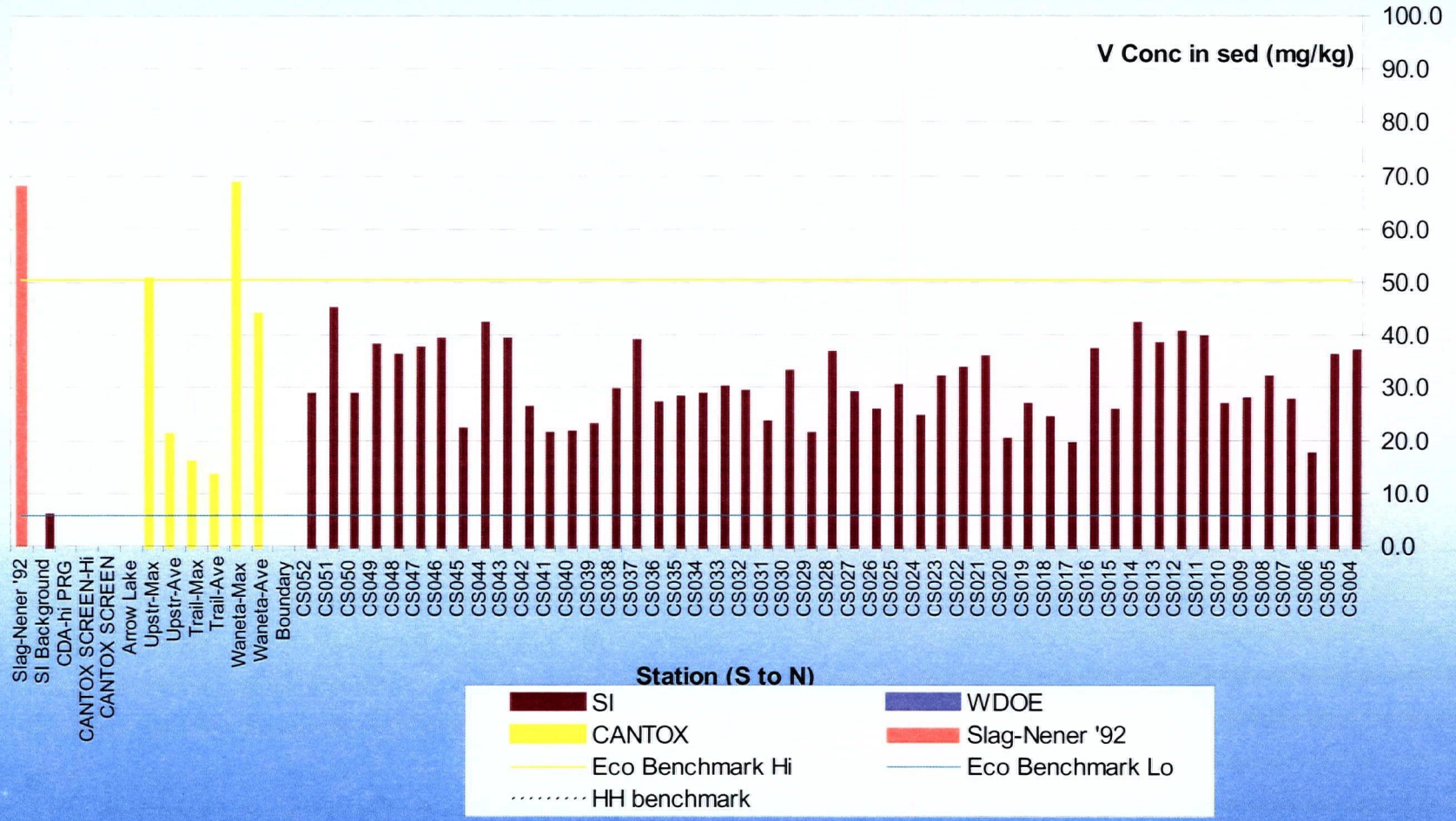
Thallium in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons
No slag analysis



Vanadium (no pattern)

Highest comparison value = 50.6 mg/kg

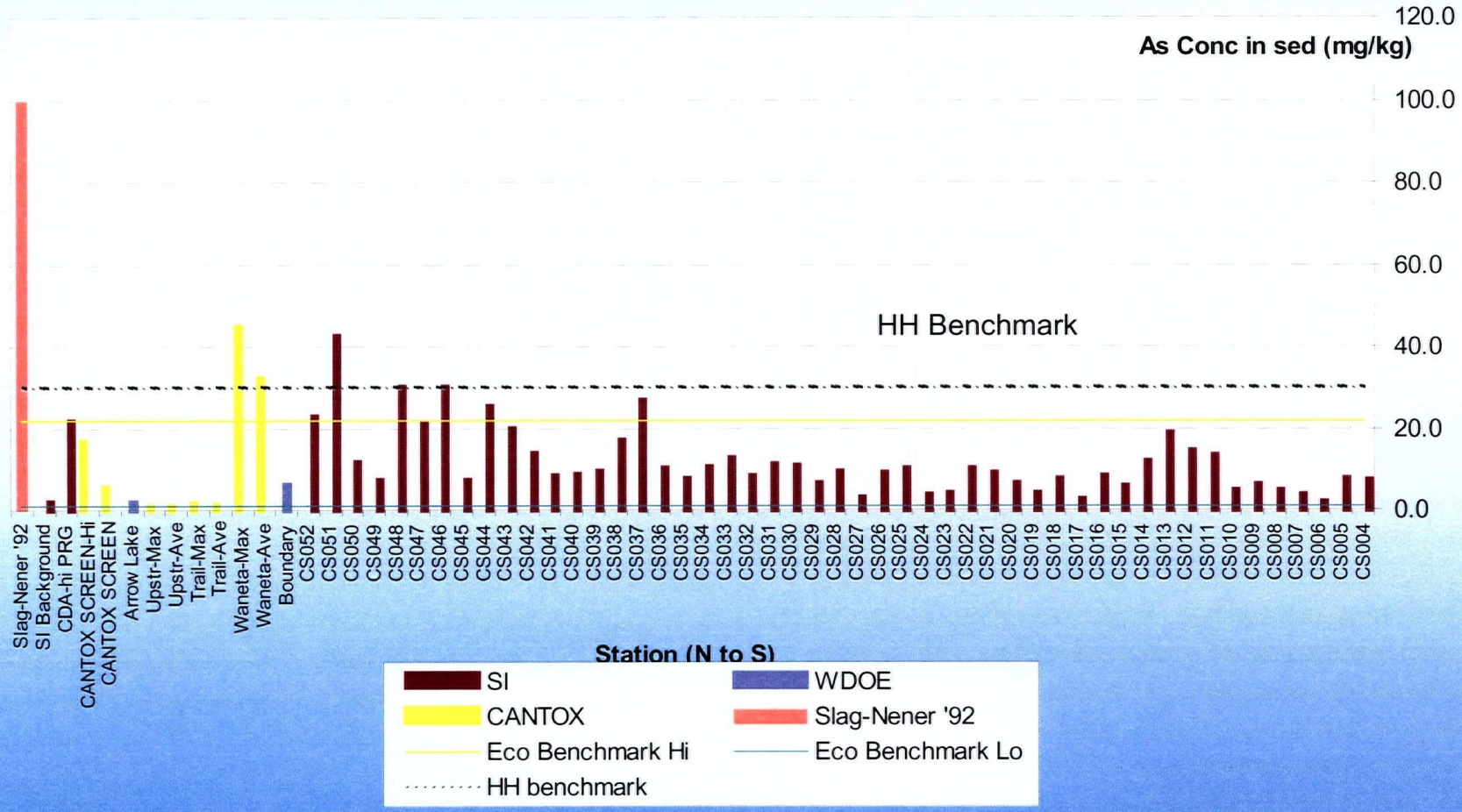
Vanadium in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons



Arsenic (upstream peaks)

Highest comparison value = 22 mg/kg

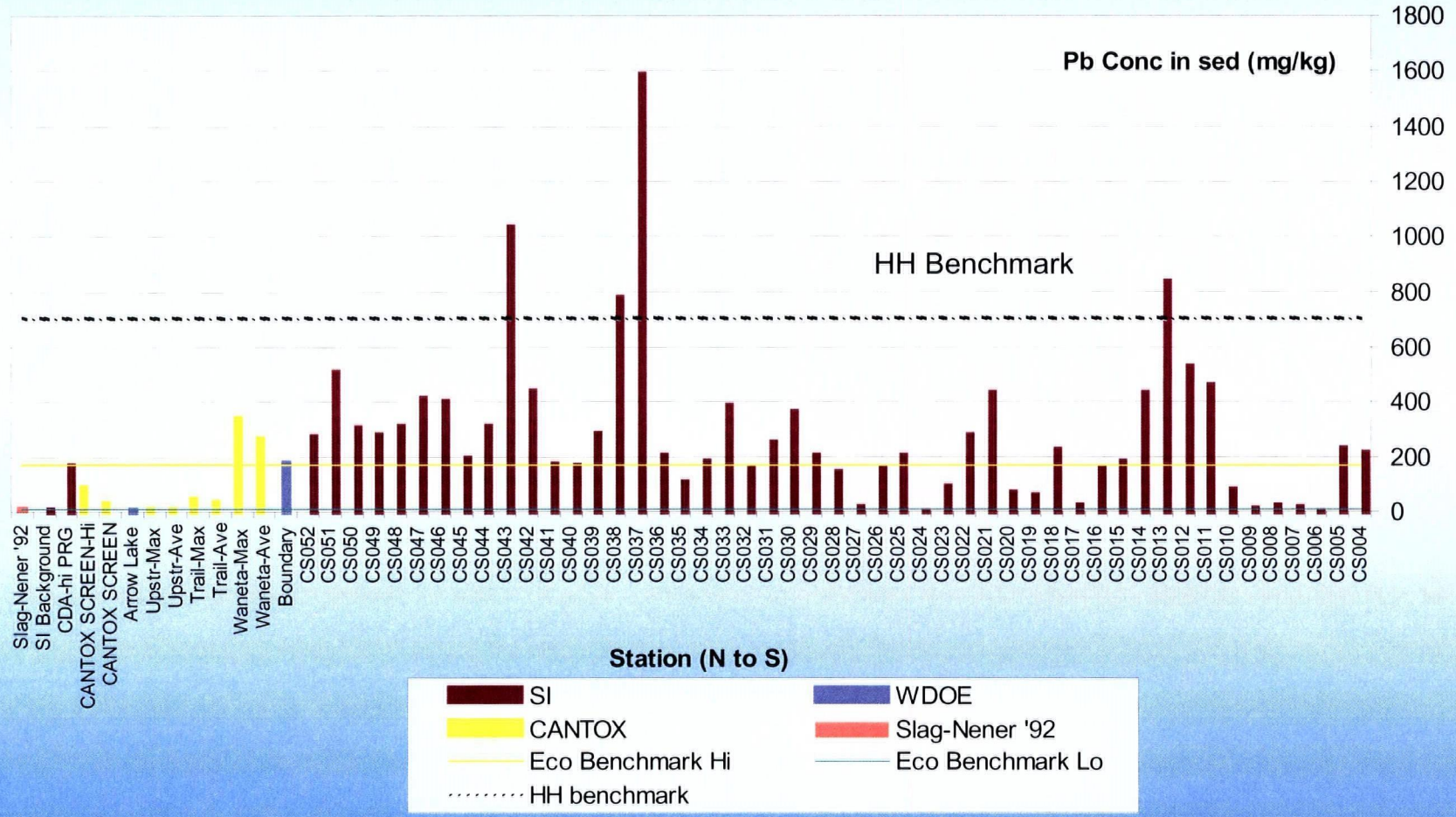
Arsenic in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons
As slag is a detection limit (<100 mg/kg dw)



Lead

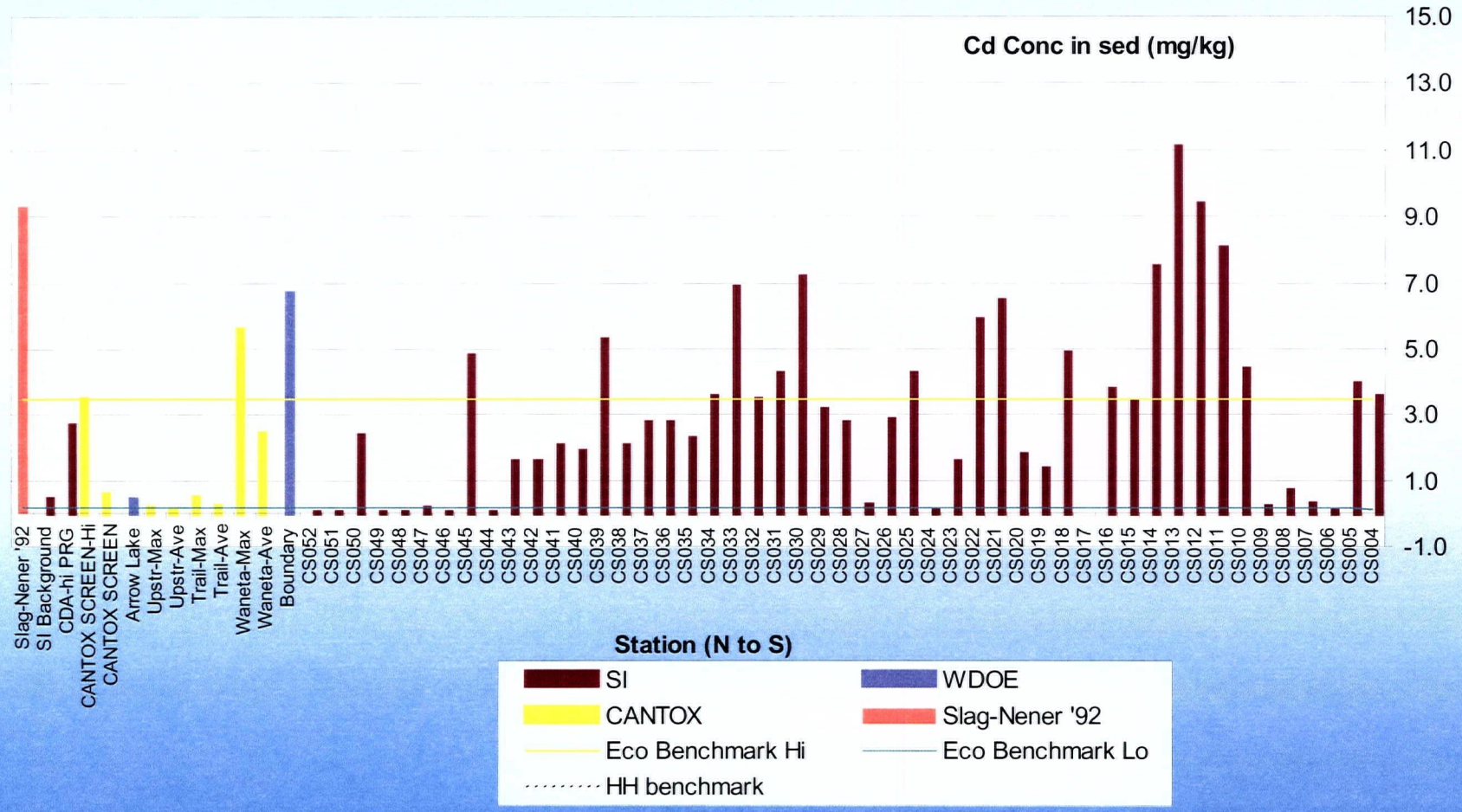
Highest eco comparison value = 171 mg/kg)

Lead in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons
Slag concentrations (ave=20 mg/kg dw, n=3; Nener 1992) seem low



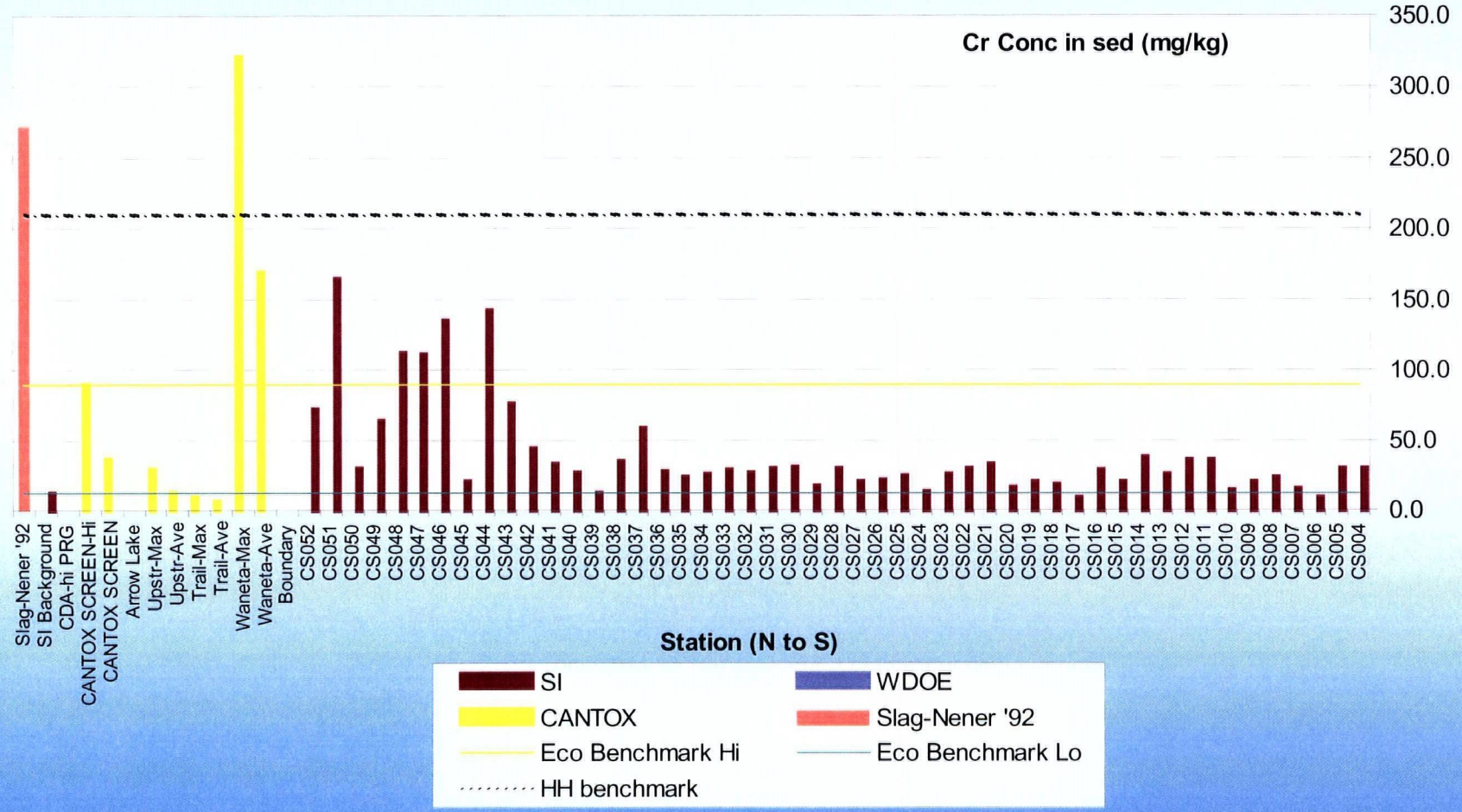
Cadmium

Cadmium in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons
One high SI data point omitted (143 mg/kg at CS017)



Chromium

Chromium in sediment (SI-2002; WDOE 2001; CANTOX 95-99)
Horizontal bars: dotted = HH comparison; solid = highest & lowest Eco comparisons



Update
EPA Fact Sheet summarizing public comments on draft UCR SI report *will be available by early March*
Upper Columbia River Site Investigation Report *will be finalized and publicly available by end of March*
EPA Region 10 Management Review Team meeting *is planned for April 2003*

Comment period on draft SI report	ended 12/31/2002
Public/stakeholder meetings held during comment period:	13
Comment letters received on draft:	28

General summary of comments

1 letter	opposed to any additional action at the Upper Columbia River and to the potential inclusion of the site on the NPL
80%	support further detailed investigation to assess possible effects of pollutants to people and the environment
1 petition	signed by 23 local residents in support of further study of river contamination

Summary of input received on possible next steps

Ferry County Commissioners - "We are opposed to further detailed investigation of the upper Columbia River under the authority of CERCLA and to the potential inclusion on the NPL."

Preston Sleeger, USDOI Ofc of the Secretary, Envtl Policy & Compliance - "The Department agrees with the ESI conclusion that further study is needed to determine the extent, degree, and risk of hazardous substance contamination in upper Columbia River sediments."

Guy Gregory, Senior Hydrogeologist, Ecology - "Based on the sampling results contained in the ESI report, Ecology suggests that further investigation of the nature and occurrence of hazardous substances in the Upper Columbia River is warranted."

Rob Duff, Manager, Ofc of Envtl Health Assessments, WA State Dept of Health - "DOH has concerns regarding exposure to mercury, PCBs and dioxin/furans through the consumption of Lake Roosevelt fish. Any further investigation of environmental contaminants should include more fish sampling if risk to human health is to be adequately characterized."

Randy Connolly, Spokane Tribal Natural Resources - "The EPA should evaluate the organic contaminants in the Columbia River and Lake Roosevelt sediments, water, and fish."

Ben Scofield, Limnologist, Spokane Tribe - "To minimize re-suspension of contaminants, drawing down the reservoir and removing sediments from depositional hot spots could be useful, if feasible."

Gary Passmore, Colville Confederated Tribes - "CCT agrees with and is fully supportive of EPA's conclusion that further investigation of the Upper Columbia River is warranted."

(b) (6) *resident, Northport, WA* - "It is very important not only for the health of the river, and the health of the people who live here and use it, but also the health of the region to go forward with the next steps of the CERCLA process. Please do not stop the work to research the possible health effects of the Columbia River. If there is a known responsible polluter, they should be held accountable. "

NOTICE: EPA officials may decide to act at variance with these general procedures based on an analysis of specific site circumstances.

EPA Region 10 Management Review Team Process
General Overview

Purpose of the process

To evaluate sites brought forward by the Site Assessment Program for regional prioritization and to reach a consensus opinion on next steps.

Upon convening the Mgmt Review Team, the internal-EPA meeting generally proceeds as follows

- The Site Assessment Manager and other technical staff will present information such as site background; contaminants found and levels; exposure pathways; the affected receptors; community input; state's, tribe's and trustees' views about the site; and other facts.
- Open discussion / Q&A
- At the end of the discussion, each voting member will be asked for her/his advisory vote on next steps.

The goal is to reach a consensus recommendation in a single meeting.

Possible recommendations by the Management Review Team

- Prepare a listing package for forwarding to headquarters
- Make no recommendation -- additional information is needed to complete the evaluation
- Do not prepare a listing package at this time
- Recommend other Superfund action (enforcement under Superfund Alternative Site guidance, other enforcement action, removal, etc.)
- Formal state deferral
- Other (e.g. combinations of the above)

Documentation

If the Review Team recommends not to move forward with preparing a listing package,

1) The specific reasons will be provided in a memorandum and a specific time frame for follow-up review of the site will be stated.
2) The memorandum will be sent to the Review Team Chairperson for signature & concurrence. A copy will be sent to the appropriate state clean-up manager and/or tribal chairperson.

If the Review Team recommends to move forward with preparing a listing package,

1) The appropriate staff will brief the Regional Administrator (RA) on the site.
2a) The RA will confirm the Management Review recommendation OR,
2b) The RA will not concur with the Management Review recommendation. In this case, a written memorandum will be prepared explaining why and what other course of action is appropriate. A copy will be sent to the state clean-up manager and/or tribal chairperson.
3) If the RA confirms the recommendation to move forward with a listing package, the EPA recommendation will be communicated to the state clean-up manager, the governor, and/or tribal chairperson.
4) Further documentation regarding the state's position will be necessary for sites considered a high priority for NPL listing. The region will send a letter to the state Governor requesting Governor support for the Management review decision. The letter will request a response on the state's position in writing.

Region 10 Management Review Team voting members:

Division Director - Chairperson
Site Assessment and Cleanup Unit 2 Manager
NPL Coordinator
Emergency Response/Cleanup Unit 1 Manager
Office of Environmental Cleanup Unit Manager (rotating)
Office of Regional Counsel Multi-Media Unit 2 Manager
Office of Environmental Assessment Risk Evaluation Unit Manager
Tribal Office Director (if site is on Tribal land)